DOCUMENT RESUME

ED 272 557 TM 860 473

AUTHOR Murnane, Richard J.
TITLE Priorities for Federal Education Statistics.
SPONS AGENCY National Center for Education Statistics (ED), Washington, DC.
PUB DATE Jun 85
NOTE 26p.; In: Invited Papers: Elementary/Secondary Education Data Redesign Project, October 1985; see TM 860 450.
PUB TYPE Viewpoints (120)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *College Entrance Examinations; *Cross Cultural Studies; *Data Collection; Dropout Rate; Educational Finance; Elementary Secondary Education; Faculty Mobility; Longitudinal Studies; *Outcomes of Education; Private Schools; *Research Needs; *Statistical Data; Teacher Salaries
IDENTIFIERS American College Testing Program; For Profit Schools; *National Assessment of Educational Progress; Scholastic Aptitude Test

ABSTRACT

The paper suggests priorities for the federal government's elementary and secondary education data collection efforts. Sections on outputs, inputs, and private schools describe what data is needed, what is already available, and what is recommended for data collection. Recommendations include a high priority for federal funding for the National Assessment of Educational Progress (NAEP). Scholastic Aptitude Test (SAT) and American College Test (ACT) scores should be published by state alongside an adjusted set of scores that takes into account the influences of participation rates, family income and private school attendance. International Association for Evaluation of Education Achievement cross-national test comparisons should receive continued financial support. A uniform method for calculating dropout rates should be implemented. Datasets are needed that provide detailed information on children's schooling as well as information on post-schooling careers and income paths. Data on teaching should be collected, including: (1) an annual comparison of salaries in teaching with those of other occupations; (2) information on SAT scores of college graduates entering teaching; and (3) teacher mobility patterns. Data on capital account expenditures should be examined in regard to use and cost. Data should be collected on private and for-profit schools. (LMO)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED272557

PRIORITIES FOR FEDERAL EDUCATION STATISTICS

Richard J. Murnane

Graduate School of Education

Harvard University

Cambridge, MA 02138

Telephone: (617)495-3575

June 1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

S. Mauchamer

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

TM 860 473

INTRODUCTION

The purpose of this paper is to suggest priorities for the federal government's elementary and secondary education data collection efforts. My suggestions reflect not only my own ideas, but also things I have learned while participating in discussions of the National Research Council Committee on Indicators of Precollege Science and Mathematics Education. This committee has spent a great deal of time over the last six months discussing the quality of available data on U.S. elementary and secondary science and mathematics education. I have tried to indicate where my ideas differ from those voiced by other members of the Committee.

I have organized the paper in three sections: outputs, inputs, and private schools. In each case, I consider what we would like to know, what the available data are, and recommendations for the federal government's data collection efforts.

I. OUTPUTS

A. Test scores

1. National Assessment of Educational Progress

What is happening to the cognitive skill levels of children attending American schools? We know much more about this question than we did twenty years ago, primarily because of the National Assessment of Educational Progress (NAEP). The NAEP data have told us, for example, that:

--the reading skills of 9-year-old children improved over the 1970s, and the gap between the reading skills of black children and white children closed somewhat;

--the average science skills of students in all age groups fell between 1970 and 1973; the skill levels of 9- and 13-year-old students were stable over the period 1973-77, while the average science skills of 17-year-olds fell still further.

While the NAEP tests results have been informative, there are important questions concerning exactly what the tests measure. In particular, many analysts have argued that the NAEP tests do not measure higher order learning skills. Other analysts have argued that the tests do not even provide good measures of children's basic science literacy. The limitations of the NAEP tests and other tests of students' cognitive skills are worrisome for four related reasons.

First, we simply do not know whether the evidence on national trends in skill levels would be different if the tests provided better measures of cognitive skills, especially the critically important higher order skills.

Second, the lack of evidence on students' higher order skills makes it impossible to differentiate among alternative explanations for puzzles posed by the NAEP test results. For example, the NAEP results indicate that the reading skills of 9-year-olds improved over the 1970s, while the reading skills of 17-year-olds remained stagnant or fell. One possible explanation for this pattern is that the NAEP tests do not measure the true skill levels of older children as well as they measure those of younger children, and that our schools have in fact been as

successful in educating older students as they have been in educating younger students. Another possibility is that the emphasis on basic skill acquisition in the early grades has had deleterious effects on students' acquisition of higher order reading skills. If true, this may have implications for how we teach children in the early grades. Yet another possibility is that many of the younger children benefited from participating in a well-developed Title I compensatory education program, while older children, if they participated in Title I at all, did so in Title I's uncertain, early years. We cannot differentiate among these possible explanations for the test score patterns until we have better measures of students' higher order reading skills.

Third, when test scores are used to assess the quality of educational programs, they tend to influence curriculum. The content of the NAEP tests may assume this role in the years to come as states contract with NAEP to provide detailed scores that can be used in statewide assessments of the quality of schooling. It would be extremely unfortunate if the lack of emphasis on higher order cognitive skills in assessment tests led to a reduction of emphasis on these skills in the curriculum.

A fourth reason for concern about test quality is that student test scores are the measure of teaching effectiveness used in almost all studies of the characteristics of effective teachers and the determinants of effective teaching. If the tests do not measure well the skills that chidren need to learn and that good teachers strive to teach, studies of the determinants of teaching effectiveness may give very misleading results.

Recommendations:

1. Continued funding for NAEP should have a very high priority. Current plans to increase the frequency with which math and science skills are tested should be retained.
2. The federal government should support Educational Testing Service's efforts to develop better NAEP tests. It is worthwhile not only to develop better multiple choice tests, but also to develop and utilize subtests that provide for open-ended responses to questions. This type of test item has greater potential for measuring students' higher order cognitive skills.
3. While it is critical to introduce better tests as soon as possible, it is important to retain enough of the old test items to permit comparison of new NAEP test results with the results of previous tests.

2. Scholastic Aptitude Tests (SAT) and American College Tests (ACT)

In recent years, comparisons among states of average SAT scores and average ACT scores have become increasingly popular. For example, they have a prominent place in the "Secretary's Wall Chart." It is well known that the average score in a state is sensitive to the average family income, the percentage of high school seniors in the state who take the test, and the percentage of students who attend private schools (Dynarsky, 1985; Howe, 1985). Moreover, in New Hampshire, the average SAT score is high, in part, because, included in the calculation are the high

scores of students from other states who attend private high schools in New Hampshire. This is probably the case in other states as well. As a result of the influences on these nonschool variables on average SAT and ACT scores, these average scores are relatively poor indicators of the quality of public education provided to students in particular states.

Recommendation:

If the federal government must publish average SAT and ACT scores by state, publish alongside them an adjusted set of scores that takes into account the influences of participation rates, family income, and private school attendance. Such adjusted scores could be calculated relatively easily using multiple regression methods. My guess is that these adjusted scores would have a somewhat different pattern from the simple average scores. If this is the case, discussion of the reasons for the differences would be provocative, and maybe even informative.

3. International Association for Evaluation of Education Achievement (IEA) Cross-national Test Comparisons

Comparing, at one point in time, the average math and science scores of students in different countries poses a host of problems. In particular, differences in the quality of national school systems is only one of many reasons why average test scores differ among countries. Consequently, I am skeptical about the possibilities of drawing reliable inferences about U.S. education from international comparisons at a single point in time. Comparisons over time offer much better prospects,

however. In particular, it is possible to examine how the achievement of U.S. students, as measured on the IEA tests, changes over time, and whether the position of U.S. students relative to students in other countries changes over time.

Recommendations:

1. Continue financial support for the IEA testing program, emphasizing the need to use test and sample designs that permit comparisons over time.
2. NCES should play a larger role in the implementation of the IEA tests in the United States.
3. Greater effort should be made to administer the IEA tests on a regular schedule so that comparisons over time can be made more reliably.
4. The Council of Chief State School Officers should be involved in administering the tests. This would improve local cooperation and reduce sampling bias due to nonresponse.

B. Dropout Rates

One important measure of the extent to which our schools accomplish the ambitious goal of educating all students is the percentage of students who graduate from high school. Most commonly, data are collected on dropout rates, which conceptually provide the same information as graduation rates. However, as Cook, Ginsberg, and Smith (1985) have documented, U.S. data on dropout rates (and graduation rates) are of very poor quality. The most common calculation method, comparing the number of students who graduate in year n with the number of students who

entered high school in year n-3, is flawed for a number of reasons, the most important of which is the high mobility rate of American families. A critical effect of mobility is that it is not possible, using the standard calculation method, to distinguish a student who has left formal schooling entirely from a student who has transferred to a school in another jurisdiction. This problem is more severe the smaller the jurisdiction because mobility across jurisdictions is more prevalent. Consequently, dropout rates for individual schools, if calculated by the method described above, are probably less accurate than dropout rates for individual states--although even state dropout rates are influenced by family migration patterns.

It would be extremely valuable to have data series that provide comparable data on dropout rates for individual schools, school districts, and states. Such data are particularly important to have at this date as many states tighten requirements for high school graduation, requiring, for example, that students complete more math and science courses and pass a minimum competency exam. One of the adverse consequences of the new regulations may be that dropout rates increase. It is also likely that the effect of the new graduation requirements on dropout rates will be sensitive to the grade level at which minimum competency tests are administered and the extent to which systematic remedial help is available to students who fail. Reliable data permitting comparisons of dropout rates among states, and within states over time, would be valuable in determining how tightened requirements affect dropouts and whether the effects are sensitive to the details of the programs.

Recommendations:

1. NCES should work with the Council of Chief State School Officers (CCSSO) to develop and implement a uniform methodology for calculating dropout rates. Given the sensitivity of many state departments of education to federal pressure, achieving agreement will not be easy. I speculate that it is more than historical chance that explains the differences in methodologies used by individual states to calculate dropout rates. States probably have good reasons for choosing a particular methodology. Understanding why individual states calculate dropout rates as they do would be helpful in negotiating movement toward a uniform methodology. Consequently, a first step in improving data on dropouts is to systematically listen to the reasons dropout rates are calculated as they are in the individual states. The Council of Chief State School Officers may be an important vehicle for soliciting information on methodologies for calculating dropout rates, and for achieving agreement on a uniform methodology.
2. NCES should encourage, and if possible, fund studies that examine whether dropout rates as calculated by applying a new uniform methodology to school, school district, and state level data are close to dropout rates calculated from longitudinal data on individual students, such as that provided by HS&B. The reason is that following individual students over time is unquestionably the best way to learn about the dropout rates of students with particular characteristics who participate in particular kinds of

educational programs. In a world of no budgetary constraints, we would want all calculations of dropout rates to be done with individual, longitudinal data. If a new, common methodology for calculating dropout rates with aggregated data is indeed satisfactory, then the estimated rates should be similar to those calculated with data from HS&B.

C. Life Outcomes: Earned Income, Occupation, Probability of Employment

While American education has many goals, no one would deny that a central one is to prepare students with the skills and attitudes that will help them to earn a good living. How well do our schools accomplish this goal? This question has been hotly contested over the last 25 years, with advocates of the "human capital" approach documenting the accomplishments, while others, for example, Christopher Jencks (1972), documenting the failures. One point on which all analysts who have studied the "economic returns to education" issue agree is that learning more requires better data. The data sets used by Jencks and the human capital economists provide only minimal information about the kinds of education students received. We need datasets that provide detailed information on children's schooling as well as information on post-schooling careers and income paths.

Creation of the National Longitudinal Study of the High School Class of 1972 (NLS72) was a major step in creating a database that provided good information on students' school experiences and longitudinal information on their subsequent

labor market experiences. An important limitation in the NLS72 database, however, is that students were interviewed for the first time during their senior year in high school, after most of the formal schooling was completed.

The High School and Beyond project is another important step in providing good longitudinal information on the schooling and subsequent labor market experiences of American students. From the HS&B data, we have already learned that the type of schooling students receive has a marked impact on their cognitive skills. I expect that subsequent research will tell us a great deal about the impact of particular types of schooling on subsequent labor market experiences. The longitudinal study slated to begin in 1988 (NELS) offers even more promise for increasing our understanding of the roles formal education plays in affecting life outcomes; NELS will conduct baseline interviews when children are still in elementary school (grade 8).

Recommendations:

1. Continue to fund additional follow-up surveys of both the NLS72 and HS&B cohorts. It is important to collect information on members of the NLS72 and HS&B samples as individuals age. Many important effects of different types of schooling may not become evident until individuals reach their mid-thirties.
2. Do not reduce the sample sizes in the NLS72 and HS&B follow-up surveys. This is critical because many important questions can be addressed with these data only if relatively large subsamples with particular characteristics are retained. For example, Manski (1985) has recently conducted an important

study of the characteristics of members of the NLS72 sample who became teachers. This could be done only because the overall sample size in the follow-up surveys was sufficiently large to include 510 individuals who became teachers. (See Section II for more on the Manski study.)

3. Provide sufficient funding for the NELS project to permit inclusion in the follow-up surveys of all members of the baseline sample, and to trace individuals who drop out of school or transfer from one school to another. Tracing students who transfer would permit an analysis of why students change schools, an important question that we know little about.

II. INPUTS

A. Teachers

1. Salaries

Common sense, as well as the results of research on the determinants of school effectiveness, point to the importance of teachers in the education process. The quality of the teachers in American schools depends on the career decisions millions of college graduates make about which occupation to enter, and how long to remain in that occupation. While many factors influence the attractiveness of alternative occupations, one critical factor is monetary compensation. For this reason it is important to collect annual data on the salaries of teachers relative to salaries in other occupations.

The evidence that relative salaries affect the career

decisions of teachers is not overwhelming (to a large extent because the research is difficult to do), but evidence does exist. For example, studies have shown that teachers' mobility decisions depend on salaries (eg. Baugh and Stone, 1982). Comparison of student test score trends during the 1970s with teacher salary trends is also suggestive. Over the period 1970-1981, students' skill levels in the physical sciences fell much more dramatically than skill levels in biology did. During the years 1974-81 (the closest years for which I could find the relevant data), the pay premium for a college graduate trained in biology who took a job in business or industry instead of becoming a teacher grew from 12 percent of a beginning teacher's salary to 31 percent. The comparable pay premium for a graduate trained in physics grew from 39 percent to 86 percent (Bacharach et al., 1984, p. 66). These patterns suggest that one of the reasons for the test score decline in science was the increasing difficulty in attracting qualified science teachers, and that this problem was more acute for physical science teachers than for biology teachers.

There are numerous difficulties in compiling comparative salaries of teachers relative to salaries in other occupations. For example, should the 9 or 10 month salaries of teachers be inflated to make them comparable with the 11 or 12 month salaries in other professions? There is no consensus on the answer to this question, and the attractiveness of teaching salaries at any one point in time is sensitive to the decision. To my mind, however, the key value of relative salary data lies in comparisons over time. For example, given that the job of

teaching is quite different from that of working in an industrial biology laboratory, we do not know whether college graduates trained in biology will find it more attractive to take a $15,000 job teaching for 10 months, or the 11 month biology job that pays 12 percent more. It is reasonable to assume, however, that schools are less able to attract talented biology teachers when the pay premium for working in industry grows to 31 percent.

Recommendation:

The federal government should publish on an annual basis comparisons of salaries in teaching with those in other occupations. The comparisons should be presented separately for each academic field. Useful comparisons would be starting salaries, and salaries for individuals with ten years of work experience. Data on starting salaries are collected currently by the Placement Center of Northwestern University, and are published by the National Educational Association. Consequently, it may not be necessary for NCES to do all of the data collection. In fact, it may be efficient to contract with Northwestern to collect comparable salary data for experienced workers. However accomplished, it is important that annual data be available to assess trends in the salaries of beginning teachers and experienced teachers relative to salaries in other occupations.

2. Quality of the Teaching Stock

Has the decline over the last 15 years in teaching salaries relative to salaries in other occupations led to a reduction in the quality of college graduates choosing to become

teachers? The evidence on the average SAT scores of new teachers suggests that this is the case. As Vance and Schlechty (1982) have documented, these scores have fallen quite dramatically in recent years.

To my mind, it is important to collect data on the SAT scores of college graduates who enter teaching. The reason is that this gives an indication of how bright college graduates perceived the attractiveness of teaching relative to that of other occupations. I want to point out that several members of the Committee on Indicators of Precollege Science and Mathematics Education disagree with this suggestion. They argue that there is no evidence indicating that a teacher's SAT score is correlated with teaching effectiveness. Also, not all college graduates who enter teaching have taken the SAT. Consequently, it is not clear what the scores are telling us.

I believe that the criticisms of my fellow Committee members are important. On the other side, however, I think about the hard questions state legislators will ask Chief State School Officers in the coming years about whether the large increases in teacher salaries that many legislatures are passing have influenced the success of public schools in attracting talented college graduates to teaching. To my mind, SAT score information, if presented carefully, could help us in answering the legislators' question.

Recommendations:

1. NCES should attempt to collect information on the SAT scores of college graduates entering teaching. This effort will probably require significant collaboration with state teacher

certification agencies. It is important that the information pertain to college graduates who actually become teachers, rather than college freshmen who indicate that they plan to become teachers--these are quite different groups.

2. The statistics that should be reported are not the average SAT scores of graduates who become teachers, but rather the percentage of teachers who have SAT scores above a specific cutoff--for example, 450 on the verbal test. The reason is that the critical information the data conveys is the ability of the schools to attract literate college graduates. Percentage of teachers with scores above a cutoff point conveys this information more accurately than the average score of teachers does.
3. It is important to compare the percentage of teachers scoring above a cutoff point with the percentage of all individuals taking the test in that year who scored above the cutoff point. The reason is that the overall SAT score distribution changes from year to year, and it is necessary to compare teachers' scores with those of other students who took the test to judge how successful our schools have been in competing for talented college graduates in a particular year.
4. It is important to keep track of changes in the composition of the pool taking the SAT so that the effects of such changes on the test score distribution can be separated from changes in the ability of the public schools to attract talented college graduates.

3. Teacher mobility patterns and what they mean

The chart on page 27 of the NCES publication, Indicators of Education Status and Trends (1985), is provocative. It shows that the SAT scores of individuals who left teaching after a few years are higher on average than the scores of teachers who remained in the classroom. How should we interpret this information? Was this pattern different twenty years ago? Are there policy changes that might alter this pattern? Would higher salaries enable school districts to retain teachers with high academic ability? We simply do not know. It may be that teachers' decisions about how long to remain in the classroom are sensitive to salaries. It is also possible that many academically talented college graduates plan to teach for a few years, and then move on to a new challenge, such as law school, and that these plans would not be altered by moderate changes in teacher salaries.

To interpret descriptive patterns such as the one presented on page 27 of Indicators and to inform policy discussions about how to attract and retained talented college graduates into teaching, we need to learn more about the determinants of teachers' career decisions. We also need this information to improve the models that are used to predict teacher shortages and surpluses. To my knowledge, in no existing model of the teacher labor market (and I include the NCES model in this category) is the supply of new entrants or the turnover rate viewed as being sensitive to salaries. This is ironic in the sense that increases in teacher salaries are a common theme in the wave of current school reform legislation aimed at coping

with the shortages predicted by the demand and supply models.

Why don't we know more about the determinants of teacher career patterns? One reason is that research on this set of issues requires data on the career decisions teachers make over time and on the attributes of their options. Little such data exist, although there are opportunities to create more at reasonable cost.

Recommendations:

1. Continue follow-up surveys of the NLS72 sample. Manski (1985) has identified 510 individuals in that sample who became teachers. One of the many benefits of following this sample as its members age is that we could study why some teachers remained in the classroom and others did not. It would be valuable in future follow-up surveys to include questions about the reasons for occupational changes, and about salaries before and after job changes.
2. NCES should ask Manski, Schlechty, and other researchers who have studied teachers' careers with the NLS72 data about how the HS&B and NELS follow-up surveys could be structured to overcome limitations of the NLS72 data for studying this set of issues.
3. The Current Population Survey (CPS) has a limited longitudinal component that can be used to examine the reasons teachers change jobs. Baugh and Stone (1982) have used CPS data to show that teachers' decisions about whether to change jobs are sensitive to salaries. My sense is that more could be learned from CPS data about the determinants of teachers' career decisions (as well as the career decisions of workers in other

occupations) if more attention to this set of questions was given in the design of questionnaire items. I encourage NCES to work with the Census Bureau in exploring the possibility of using the CPS surveys to learn more about teachers' career paths, and specifically about the reasons for job changes.

B. Capital Accounts

NCES collects a significant amount of information on the capital expenditures of local school districts. There is no question that the quality of the physical plant influences the quality of life for teachers and students in local school districts and that the cost of the physical plant is a significant burden on many school districts. There is a question in my mind, however, about the usefulness of the data that NCES collects on capital account expenditures. I have never seen a study that uses these data in a manner that improves our understanding of how U.S. education works.

Recommendation

NCES should explore whether the data it collects on capital account expenditures are used, and if so, whether the uses justify the cost of collecting and processing these data.

III. PRIVATE SCHOOLS

What roles do nonpublic schools play in educating American children? In recent years research by James Coleman (1982) and others using the HS&B data has increased our knowledge of the roles that certain types of nonpublic schools, especially Catholic schools, play. We still know very little about other nonpublic schools, however. I focus my attention on two types of nonpublic schools that may be playing an increasing role in American education: private schools as an after-hours complement to public schools, and for-profit private schools.

A. After-Hours Private Schools

A recent article in the New York Times reported that an increasing number of American children are attending private schools after regular school hours to supplement the instruction they receive in public schools. If this is indeed the case, then it introduces a new determinant of the skill distribution of American students, and another mechanism through which affluent families can provide for their children better education than that provided to children from poor families. (In Japan, private after-hours schools, called Juku, are an important mechanism through which middle class families prepare their children for the national exams that determine entrance to public universities; see Cummings, 1980 for more on Juku.) Little is known about after-hours private schools in the U.S., and it seems worthwhile to try to learn more about them.

Recommendations:

1. In the design of the new longitudinal study of American students (NELS), include a set of questions asking whether students do attend after-hours schools, and if so, what the schools do and what they cost.
2. Include a similar set of questions in the October CPS survey.

B. For-Profit Schools

The 1977 Census of Service Industries reported the existence of 2237 for-profit elementary and secondary schools in the U.S. These schools were very small, paid their teachers low salaries, and were disproportionately located in the South. A recent New York Times article reported that the number of for-profit schools is growing. The article described a number of relatively expensive for-profit schools serving students from upper middle class families. This description seems different from the very limited description of for-profit private schools that can be gleaned from the 1977 Census of Service Industries.

It would be worthwhile to learn more about the number of for-profit elementary and secondary schools in the U.S., where they are located, what tuitions they charge, and whom they serve. Once we know the answers to these questions, we could explore whether for-profit schools operate differently from not-for-profit schools. This would be valuable in thinking about the design of state regulations of private schools, and the design of voucher systems--topics of increasing interest in many states.

Recommendations:

1. Include questions in the next Census of Service Industries that will provide information about for-profit schools.
2. Explore whether it is possible to use IRS data to learn about trends in the number of for-profit schools, their locations, and their scale of operation.

IV. CONCLUDING COMMENT

I would like to express my support for the process NCES has initiated in attempting to improve the quality of federal statistics on elementary and secondary education. Asking a large number of individuals from different backgrounds for their ideas is essential to improving NCES's contribution to understanding U.S. education. It is also, however, an invitation to criticisms from many fronts. I admire the decision of the NCES leadership to solicit suggestions with the inevitable accompanying criticisms and the decision to make all of the suggestions public. I look forward to reading the suggestions of other commentators.

I conclude my comments with one final suggestion. As the NCES staff wades through the many sets of suggestions, it is inevitable that many suggestions cannot be implemented because of their cost, because of the politics of education in our federal system, and for a variety of other reasons. While most users of NCES statistics are acutely aware of their limitations, many are not aware of the reasons certain types of data are not collected. Producing a document that attempts to explain these reasons could

be very informative. It is also possible that a statement of the reaons why potentially valuable data are not collected could lead to changes in the budgetary or political conditions that prevent the data collection.

REFERENCES

Bacharach, S.B., D.B. Lipsky, and J.B. Shedd. 1984. Paying for Better Teaching: Merit Pay and Its Alternatives. Ithica, N.Y.: Organizational Analysis and Practice.

Baugh, W.B. and J.S. Stone. 1982. "Mobility and Wage Equilibration in the Educator Labor Market." Economics of Education Review 2.

Coleman, J.S., T. Hoffer, and S. Kilgore. 1982. High School Achievement. New York: Basic Books.

Cook, C., A. Ginsburg, and M. Smith. 1985. "Researchers Find that Education Statistics Are in a Sorry State." Basic Education 29: 3-8.

Cummings, W.K. 1980. Education and Equality in Japan. Princeton, N.J.: Princeton University Press.

Dynarsky, M. 1985. "The Scholastic Aptitude Test: Participation and Performance." Working Paper No. 258. Department of Economics, University of California, Davis.

Howe, H. 1985. "Let's Have Another SAT Score Decline." Phi Delta Kappan 66: 599-602.

Indicators of Education Status and Trends. 1985. Washington, D.C.: U.S. Department of Education.

Jencks, C., M. Smith, H. Acland, M.J. Bane, D. Cohen, H. Gintis, B. Heyns. and S. Michelson. 1972. Inequality. New York: Basic Books.

Manski, C.F. 1985. "Academic Ability, Earnings, and The Decision to Become a Teacher: Evidence from the National Longitudinal Study of the High School Class of 1972." Working Paper No. 1539. Cambridge, MA: National Bureau of Economic Research.

Vance, V.S. and P.C. Schlechty. 1982. "The Distribution of Academic Ability in the Teaching Force: Policy Implications." Phi Delta Kappan 64: 22-27.